(iii) Has remote readouts at the cargo control station.

(2) If vacuum protection is required under §154.804, a vacuum gauge meeting paragraphs (a)(1)(i), (a)(1)(ii), and (a)(1)(iii) of this section.

(b) The vessel must have at least one high pressure alarm that:

(1) Actuates before the pressure in any cargo tank exceeds the maximum pressure specially approved by the Commandant (CG–OES); and

(2) Actuates an audible and visual alarm at the cargo control station, and a remote group alarm in the wheelhouse.

(c) If vacuum protection is required under §154.804, the vessel must have at least one low pressure alarm that:

(1) Actuates before the pressure in any cargo tank falls below the minimum pressure specially approved by the Commandant (CG–522); and

(2) Actuates an audible and visual alarm at the cargo control station, and a remote group alarm in the wheelhouse.

(d) At least one pressure gauge must be fitted on each:

(1) Enclosed hold;

(2) Enclosed interbarrier space;

(3) Cargo pump discharge line;

(4) Liquid cargo manifold; and

(5) Vapor cargo manifold.

(e) There must be a local manifold pressure gauge between each manifold stop valve and each hose connection to the shore.

[CGD 74–289, 44 FR 26009, May 3, 1979, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 154.1340 Temperature measuring devices.

(a) Each cargo tank must have devices that measure the temperature:

(1) At the bottom of the tank; and

(2) Near the top of the tank and below the maximum liquid level allowed under §154.1844.

(b) Each device required by paragraph (a) must have a readout at the cargo control station.

(c) Except for independent tanks type C, each cargo containment system for a design temperature colder than −55 °C (−67 °F) must have temperature measuring devices that meet the following:

(1) The number and location of the devices must be specially approved by the Commandant (CG–OES).

(2) The devices must be within the cargo tank's insulation or on the adjacent hull structure.

(3) Each device must show the temperature continuously or at regular intervals of one hour or less.

(4) Each device must actuate an audible and visual alarm at the cargo control station and a remote group alarm in the wheelhouse before the temperature of the steel of the adjacent hull structure is cooled below the lowest temperature allowed for the steel under §154.172.

(d) For each cargo tank with a design temperature colder than −55 °C (−67 °F), the number and arrangement of the devices that show the temperature of the tank during cool down procedures must be specially approved by the Commandant (CG–OES).

[CGD 74–289, 44 FR 26009, May 3, 1979, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 154.1345 Gas detection.

(a) Each vessel carrying a cargo that is designated with an ''I'' or ''I and T'' in Table 4 must have:

(1) A fixed flammable gas detection system that meets §154.1350; and

(2) Two portable gas detectors that can each measure 0 to 100% of the lower flammable limit of the cargo carried.

(b) Each vessel carrying a cargo that is designated with a ''T'' or ''I and T'' in Table 4 must have:

(1) Two portable gas detectors that show if the concentration of cargo is above or below the threshold limit value listed in 29 CFR 1910.1000 for that cargo; and

(2) Fixed gas sampling tubes in each hold space and interbarrier space with:

(i) The number of tubes specially approved by the Commandant (CG–OES);

(ii) Each tube valved and capped above the main deck unless it is connected to a fixed toxic gas detector;

(iii) If the vessel carries cargo that is heavier than the atmosphere of the space, each tube's open end in the lower part of the space;

(iv) If the vessel carries cargo that is lighter than the atmosphere of the